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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/814,210	03/31/2004	Uthamalingam Balachandran	ANL 288	6010
43008	7590	04/04/2007		
HARRY M. LEVY OLSON & HIERL, LTD. 20 North Wacker 36th Floor CHICAGO, IL 60606-4401			EXAMINER BULLOCK, IN SUK C	
			ART UNIT	PAPER NUMBER
			1764	
SHORTENED STATUTORY PERIOD OF RESPONSE		MAIL DATE	DELIVERY MODE	
3 MONTHS		04/04/2007	PAPER	

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/814,210

Applicant(s)

BALACHANDRAN,
UTHAMALINGAM

Examiner

In Suk Bullock

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-37 is/are pending in the application.
- 4a) Of the above claim(s) 30-37 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-29 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 March 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 3/31/04.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-29, drawn to a method for converting C₂ and/or higher alkanes to olefins, classified in class 585, subclass 654.
- II. Claims 30-37, drawn to an apparatus, classified in class 96, subclass 4.

The inventions are distinct, each from the other because of the following reasons:

Inventions I and II are related as process and apparatus for its practice. The inventions are distinct if it can be shown that either: (1) the process as claimed can be practiced by another and materially different apparatus or by hand, or (2) the apparatus as claimed can be used to practice another and materially different process. (MPEP § 806.05(e)). In this case the process as claimed can be practiced by another and materially different apparatus such as a dehydrogenation reactor containing a catalyst. Alternatively, the apparatus as claimed can be used to practice another and materially different process such as catalytic oxidation.

Because these inventions are independent or distinct for the reasons given above and there would be a serious burden on the examiner if restriction is not required because the inventions have acquired a separate status in the art due to their recognized divergent subject matter, restriction for examination purposes as indicated is proper.

During a telephone conversation with Mr. Harry Levy on March 21, 2007 a provisional election was made with traverse to prosecute the invention of Group I,

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claims 1-29. Affirmation of this election must be made by applicant in replying to this Office action. Claims 30-37 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Drawings

Replacement drawing sheet in compliance with 37 CFR 1.121(d) is required in reply to this Office action because the original drawing is hand drawn. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action.

Claim Objections

Claims 11-13, are objected to because of the following informalities: for consistency claims 11-13 should recite "the metal oxide ceramic powder" since the independent claim 1 recites "metal oxide ceramic powder".

The word "yttria" is misspelled in claims 12 and 26.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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Claims 26 and 27 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 19 recites "Al oxide or stabilized or partially stabilized Zr oxide ceramic powder" while claims 26 and 27 recite "the metal oxide ceramic contains" Since there is no "metal oxide" recited in claim 19, claims 26 and 27 are unclear. It is suggested that claims 26 and 27 be amended to recite, "wherein the stabilized or partially stabilized Zr oxide is"

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent 4,313,013 to Harris (hereinafter "Harris") in view of US Patent 5,980,989 to Takahashi et al. (hereinafter "Takahashi").

Harris discloses that palladium and certain alloys of palladium are selectively permeable to hydrogen. A consequence of this property is that the equilibrium of gas phase reactions in which hydrogen is reactant or a product can be affected by the presence of such a hydrogen permeable membrane. The process of dehydrogenation of hydrocarbons, e.g., conversion of paraffins to monoolefins is exemplary of such reactions. See col. 2, lines 4-13. Harris further discloses a process for the recovery of hydrogen, as in a hydrocarbon dehydrogenation process, by subjecting a flow of a mixture of hydrocarbon and hydrogen to contact with a palladium alloy hydrogen diffusion membrane which has been treated with at least one volatile compound of silicon. See col. 1, lines 18-62. The hydrogen permeable membranes include Pd-Ag alloy and Pd-Cu alloy (col. 2, lines 26-34).

Harris fails to disclose the claimed metal oxide ceramic powder.

Takahashi discloses that known palladium alloys used for hydrogen diffusion are deposited on a surface of an inorganic porous support such as alumina or the like to increase the mechanical strength of the thin film comprising palladium alloy (col. 1, lines 20-33).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Harris by using a support for the

palladium alloy membrane as taught by Harris because Harris has taught that support increases the mechanical strength of the palladium alloy.

Regarding the claimed weight percent of silver or copper contained in the palladium alloy and the claimed amount of metal powder in the membrane, Harris discloses in Example I 75 wt% palladium and 25 wt% silver. Overlapping ranges have been held to be prima facie evidence of obviousness. In re Malagari, 182 USPQ 549 (CCPA 1974).

Regarding the claimed yttria stabilized ZrO_2 , it is noted that Takahashi discloses an inorganic porous support which would include the claimed yttria stabilized ZrO_2 .

Regarding the claimed membrane is permeable to atomic hydrogen and has substantially no interconnected porosity, it is expected that the membrane as disclosed by Harris and Takahashi combined would perform in the claimed manner since the membrane is similar to that which is claimed.

Regarding the claimed thickness and theoretical density of the membrane, it is within the level of one having ordinary skill in the art to have determined the effective thickness and theoretical density of the membrane through routine experimentation.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140

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F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1-29 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-18 of U.S. Patent No. 6,569,226.

Although the conflicting claims are not identical, they are not patentably distinct from each other because both the present application and the patent are directed to a dehydrogenation process using a supported palladium alloy membrane.

Although Patent 6,569,226 does not explicitly state a method for dehydrogenating C₂ and higher alkanes to olefins, it would have been obvious to one having ordinary skill in the art to recognize that the method for extracting hydrogen from a fluid stream as recited in the patent would read upon the specific dehydrogenation process claimed in the present application.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to In Suk Bullock whose telephone number is 571-272-5954. The examiner can normally be reached on Monday - Friday 6:00-2:30.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on 571-272-1444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


I.B.


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